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West Virginia No. 2

Forest Statistics for the Eastern Panhandle of West Virginia

Northeastern Forest Experiment Station

Upper Darby, Pennsylvania
Ralph W. Marquis, Director

1953

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United States Department of Agriculture • • • Forest Service

F O R E W O R D

This is the second in a series of reports about forest areas and timber volume in the State of West Virginia. It is a product of the forest survey of the Northeast, carried on by the Northeastern Forest Experiment Station as part of the Nation-wide forest survey being made by the Forest Service, U. S. Department of Agriculture.

Similar reports will be issued for the other six sections of the State.

The Forest Survey in West Virginia was carried out in collaboration with the West Virginia Conservation Commission. This agency provided the aerial photographs that were used and assigned personnel for a joint forest- and game-habitat survey.

Field work in the Eastern Panhandle Section of West Virginia was supervised by Harry W. Camp, Jr. C. Allen Bickford developed the statistical procedures used in the survey. Computations were made under the supervision of Roland H. Ferguson.

Ralph W. Marquis

Ralph W. Marquis
Director

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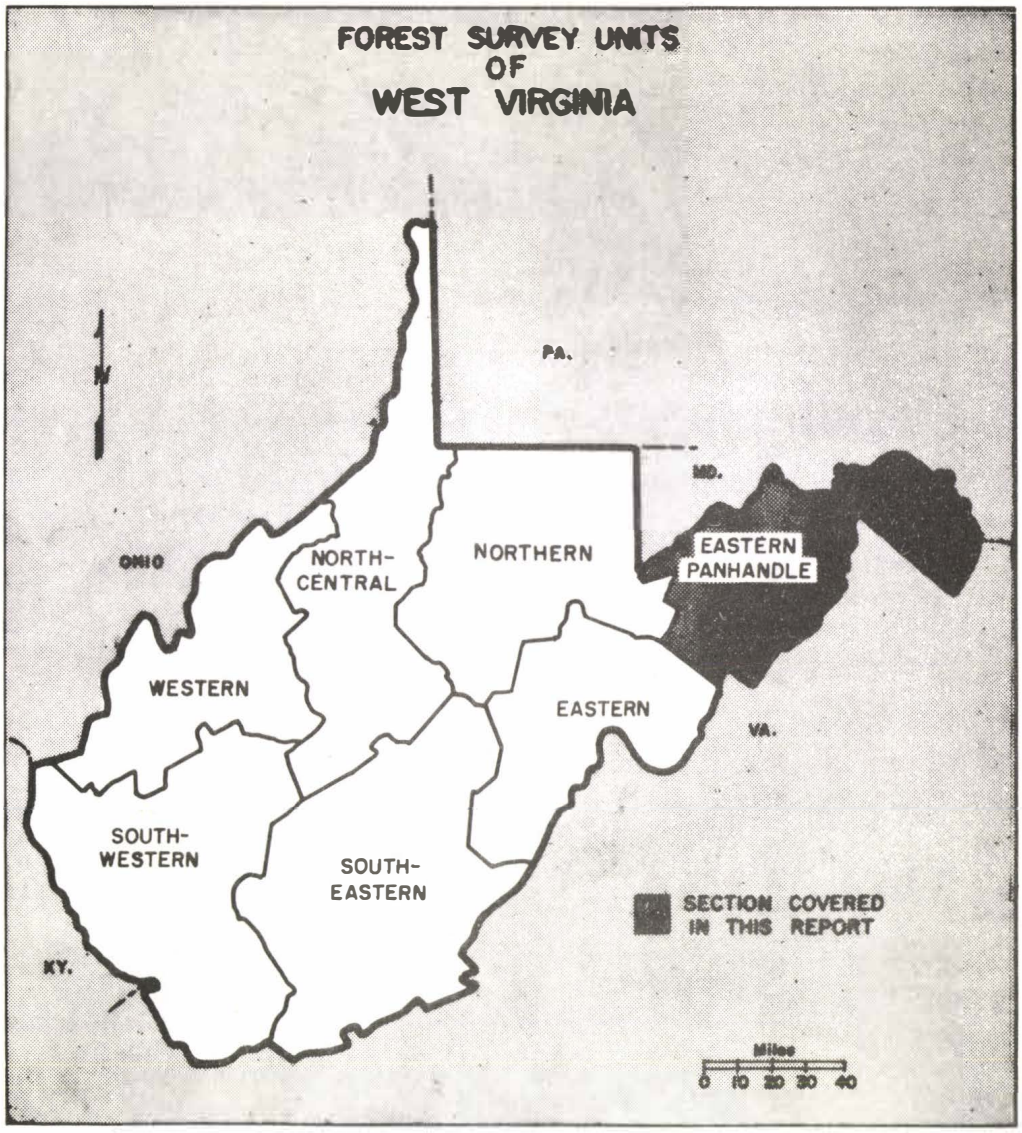
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FOREST STATISTICS

FOR THE

EASTERN PANHANDLE

OF WEST VIRGINIA

by

Robert D. Wray, *forest economist*

Northeastern Forest Experiment Station
Forest Service, U.S. Dept. Agriculture

GENERAL

The Eastern Panhandle Section of West Virginia contains seven counties: Berkeley, Grant, Hampshire, Hardy, Jefferson, Mineral, and Morgan.

In the eastern part of the section, mostly in Berkeley and Jefferson Counties, the land is flat and rich, with a soil of limestone origin. This land is farmed intensively, and there is little forest land here.

West of this area is the Allegheny Plateau, gently rolling high land. In the extreme western part of the section the plateau is broken up by a series of steep, straight, rocky ridges that stretch from the Maryland border southwest across Grant County and adjacent counties. This plateau country is mostly forest land.

The Forest Area

The Eastern Panhandle Section has a total land area of 1,786,000 acres. Nearly two-thirds of the land is forested.

Commercial forest land amounts to 1,132,000 acres. Less than 10,000 acres of forest land are reserved from timber cutting. Most of this area is in State parks.

All but the two easternmost counties--Berkeley and Jefferson--are more than 60 percent forested.

Ownership

About 93 percent of the commercial forest land is held by private owners: 44 percent by farmers and 49 percent by other private landowners. There are about half a dozen private holdings of more than 5,000 acres of forest land each in this area. The owners are mining companies, railroads, and private individuals.

The 7 percent that is in public ownership is largely in the Monongahela and George Washington National Forests.

The Forest Types

One or more species of oak are prominent on 80 percent of the forest land. Red oak, white oak, and chestnut oak types occupy 54 percent of the total forest land. On another 25 percent the oaks appear in mixture with the hard pines. Pure stands of pitch and Virginia pine are found on 8 percent of the forest land. The remaining 13 percent is occupied chiefly by the sugar maple-beech-yellow birch and yellow-poplar types. There are also small areas of aspen, river birch-sycamore, and bottomland hardwood types.

Condition Of The Forests

Nearly one-fourth of the saw-timber volume is found on less than 5 percent of the forest land. This is the land that averages more than 5,000 board feet per acre.

About one-fourth of the forest land supports saw-timber stands of 1,500 to 5,000 board feet per acre. The bulk of the forest land--70 percent--has little or no merchantable saw timber.

Timber Volume

The Eastern Panhandle Section contains more than 1 billion board feet of saw timber. Nearly two-thirds of this volume is made up of the oaks. About 17 percent is found in

softwood species, chiefly the hard pines. The rest is a mixture of various other hardwoods.

(Although all of the volume reported above meets the requirements for saw timber, some of it is not operable from a strictly business viewpoint. Operability depends upon species, quality, volume per acre, accessibility, markets, and so on. These are the things that help determine whether one can cut timber and make money. However, it is not within the scope of this statistical report to distinguish between operable and inoperable timber stands. The purpose here is merely to report the total amount of timber that exists in this part of West Virginia. These statistics will be analyzed later in a comprehensive report for the entire State.)

The growing stock amounts to 622 million cubic feet. About 40 percent of this is saw-timber trees; 60 percent is in pole-timber trees.

The total cubic volume is the equivalent of 7-3/4 million cords. More than 85 percent of this volume is in trees of less than 15 inches' diameter. These smaller trees are the ones most in demand for pulpwood.

EASTERN PANHANDLE OF WEST VIRGINIA

Table 1.--Land area and forest area, 1949

Class	Area	
	Acres	Percent
Forest land[1]:		
Commercial	1,132,200	63
Noncommercial[2]	9,800	1
Total forest land	1,142,000	64
Nonforest land[3]	644,200	36
All land[4]	1,786,200	100

[1] See Appendix for definitions.

[2] Includes 5,800 acres in the Cacapon State Park and 3,800 acres in the Lost River State Park.

[3] Includes about 10,000 acres of water in areas less than 40 acres.

[4] From Areas of the United States, 1950, Bureau of the Census.

EASTERN PANHANDLE OF WEST VIRGINIA

Table 2.--Land area and commercial forest area by county, 1949

County	Land	Commercial forest	
	Acres	Acres	Percent
Berkeley	202,200	79,100	39
Grant	305,300	219,800	72
Hampshire	409,000	294,300	72
Hardy	374,400	280,000	75
Jefferson	135,000	23,800	18
Mineral	211,200	139,000	66
Morgan	149,100	96,200	64
Total	1,786,200	1,132,200	63

Table 3.--Commercial forest area by ownership, 1949

Ownership	Area	
	Acres	Percent
Private:		
Farm forest land[1]	499,400	44
Other private	551,300	49
Total private	1,050,700	93
Public:		
National forest	65,000	6
State[2]	16,400	1
County	100	(3/)
Total public	81,500	7
All ownerships	1,132,200	100

[1]Census of Agriculture, 1950.

[2]Includes 15,900 acres in State game refuges.

[3]Less than 0.5 percent.

EASTERN PANHANDLE OF WEST VIGRINIA

Table 4.--Commercial forest area by forest type, 1949

Forest type	Area	
	Acres	Percent
Red oak	340,100	30
White oak	153,100	13
Chestnut oak	124,800	11
Sugar maple-beech-yellow birch	44,600	4
Yellow-poplar	40,900	4
Other hardwood types	52,900	5
Hard pine-oak	283,900	25
Hard pine types	91,900	8
All types	1,132,200	100

Table 5.--Commercial forest area by stand-size class, 1949

Stand-size class	Area	
	Acres	Percent
Saw-timber stands:		
More than 5,000 bd.ft. per acre	54,900	5
1,500-5,000 bd.ft. per acre	279,400	25
Pole-timber stands:		
More than 600 cu.ft. per acre	275,600	24
200-600 cu.ft. per acre	282,000	25
Other stands	240,300	21
All stands	1,132,200	100

Table 6.--Net volume of live timber on commercial forest land by species, 1949

Species	Growing stock		Saw timber[1]
	Thousand cu.ft.	Equivalent in cords[2]	Thousand bd.ft.
Red oak	156,000	1,950,000	418,900
White oak	90,400	1,130,000	195,900
Chestnut oak	102,800	1,285,000	120,600
Hickory	39,200	490,000	40,700
Yellow-poplar	10,700	133,800	29,000
Basswood	14,200	177,500	21,200
Sugar maple	9,200	115,000	19,400
Red maple	12,300	153,800	12,500
Ash	15,300	191,200	14,900
Elm	3,300	41,200	9,900
Other hardwood	56,400	705,000	55,100
All hardwood	509,800	6,372,500	938,100
Hard pine	102,000	1,275,000	166,400
White pine	6,100	76,300	23,900
Other softwood	3,600	45,000	5,800
All softwood	111,700	1,396,300	196,100
All species[3]	621,500	7,768,800	1,134,200

[1]International $\frac{1}{4}$-inch log rule.

[2]Rough standard cords. 1 cord = 80 cubic feet.

[3]In addition there are 64 million cubic feet (net volume) in live cull trees.

Table 7.--Net volume of live timber on commercial forest land by diameter class, 1949

Diameter class[1] (inches at breast height)	Growing stock	Saw timber
	Thousand cu.ft.	Thousand bd.ft.
Hardwood:		
6	94,500	--
8	114,900	--
10	105,400	--
12	72,400	297,100
14	55,200	263,300
16	27,700	148,200
18	20,500	111,700
20	9,500	57,500
22	4,300	25,300
24	2,800	16,500
26 and larger	2,600	18,500
All hardwood	509,800	938,100
Softwood:		
6	33,700	--
8	29,200	--
10	22,100	79,200
12	14,400	61,000
14	7,800	34,200
16	2,900	14,300
18 and larger	1,600	7,400
All softwood	111,700	196,100
Softwood and hardwood	621,500	1,134,200

[1]The midpoint of each 2-inch diameter class is indicated.

Table 8.--Average net volume per acre of live timber on commercial forest land, by stand-size class, 1949

Stand-size class	Growing stock	Saw timber
	Cubic feet	Board feet
Saw-timber stands	930	2,460
Pole-timber stands	530	480
Other stands	80	180
All stands[1]	550	1,000

[1]Hardwood constitutes 83 percent of the total board-foot volume, or 82 percent of the total cubic-foot volume.

APPENDIX

DEFINITIONS OF TERMS

Forest Area

Forest land area.--Includes (a) lands that are at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting influence on the climate or on the water regime; (b) land from which the trees described in (a) have been removed to less than 10 percent stocking and which has not been developed for other use; and (c) afforested areas. (Forest tracts of less than 1 acre and isolated strips of timber less than 120 feet wide are excluded.)

Commercial forest land area.--Forest land that is (a) producing, or physically capable of producing, usable crops of wood (usually saw timber), (b) economically available now or prospectively, and (c) not withdrawn from timber utilization.

Noncommercial forest land area.--Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order, but that otherwise qualifies as commercial forest land, or (b) incapable of yielding usable wood products (usually saw timber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Forest Types

Forest types are defined according to the species, or species group, that makes up the major portion of the stand in terms of board feet in saw-timber stands or number of stems in other stands.

"Other hardwood types" include aspen-paper birch, oak-white pine, river birch-sycamore, and bottomland hardwoods. The latter type consists mostly of blackgum, white oak, red maple, elm, and ash.

A small amount of old-field redcedar occurs in the Eastern Panhandle Section. This acreage has been included in the hard pine-oak group.

Stand-Size Classes

Saw-timber stands.--Stands with saw-timber trees having a minimum net volume per acre of 1,500 board feet, International $\frac{1}{4}$-inch rule.

Pole-timber stands.--Stands failing to meet the saw-timber stand specifications, but at least 10 percent stocked with pole-timber and larger trees (5.0 inches d.b.h. and larger), and with at least half of the minimum stocking in pole-timber trees. (Pole-timber stands carry at least 200 cubic feet per acre.)

Other stands.--Forest stands that do not qualify as saw timber or pole timber; stands of seedlings and saplings; nonstocked areas.

Tree Classes

Saw-timber trees.--Trees of commercial species that contain at least one merchantable sawlog as defined by regional practice and that are of the following minimum diameters at breast height (d.b.h.): Softwoods 9.0 inches and hardwoods 11.0 inches. (All butt sawlogs are considered merchantable. Where the butt is defective, upper sawlogs are considered merchantable if they account--in terms of aggregate volume--for 50 percent or more of the gross volume below the top of the uppermost sawlog. Softwood sawlogs are at least 6 inches in diameter inside bark at small end; 8 to 16 feet in length; sound and straight enough to be manufactured into standard lumber. The smaller logs are generally free of surface defects other than small tight knots. Hardwood sawlogs are at least 8 inches in diameter inside bark at small end; 8 to 16 feet in length; suitable for sawing into standard lumber, construction timber, or ties.)

Pole-timber trees.--Trees 5.0 inches d.b.h. and larger of commercial species that do not meet the specifications for saw-timber trees but do meet regional specifications of species, soundness, and freedom from defect. (These are the trees that are straight and clear enough to make saw-timber trees eventually.)

Seedling and sapling trees.--Trees of commercial species less than 5.0 inches in diameter at breast height.

Cull trees.--Live trees of saw-timber or pole-timber size that are unmerchantable for sawlogs now or prospectively because of defect, rot, or species.

Timber Volume

Growing stock.--Net volume, in cubic feet, of live saw-timber trees and live pole-timber trees from stump to a minimum 4.0-inch top (of central stem) inside bark.

(This volume is also given in rough, standard cords, bark included. Cord volume is derived from cubic-foot volume by applying a factor of 80 cubic feet per cord.)

Live saw-timber volume.--Net volume in board feet, International ¼-inch rule, of live saw-timber trees.

FOREST SURVEY METHODS

These forest statistics for the Eastern Panhandle Section of West Virginia are based on information gathered from sample plots. These plots are distributed randomly over the entire area.

They were first located on aerial photographs. Trained photo interpreters then examined the photos and classified each forest plot according to stand size. Field crews inspected enough plots on the ground to attain a specified level of statistical accuracy. Species and volume data were collected on these ground plots.

The survey was designed for maximum accuracy in the estimate of total merchantable cubic volume.

ACCURACY OF THE ESTIMATES

The estimates in this report may contain two kinds of error.

First, photo interpreters may make mistakes of judgment and fieldmen may make mistakes in measuring or recording. There is no practical way of finding out just how often such errors occur. But they are kept to a minimum by closely checking all phases of the work.

The second kind of error is associated with sampling procedures. The size of this error can be measured. In the Eastern Panhandle Section the chances are 2 to 1 that the error will not exceed 2.4 percent of the total forest area, 10.5 percent of the total board-foot volume, or 7.0 percent of the total cubic-foot volume.

These percentages show that the area estimates are more reliable than the volume estimates, and that the cubic-foot estimates are more reliable than the board-foot estimates.

In each of the tables, the total figures are more reliable than the subtotals. The subtotals are more reliable than any of the individual figures. Figures that are small in relation to totals are subject to larger sampling errors.

SPECIES TALLIED

The various commercial tree species tallied in the Eastern Panhandle Section of West Virginia are listed below.[1] Approved common names are shown in parentheses if these differ from the brief name used in the tables.

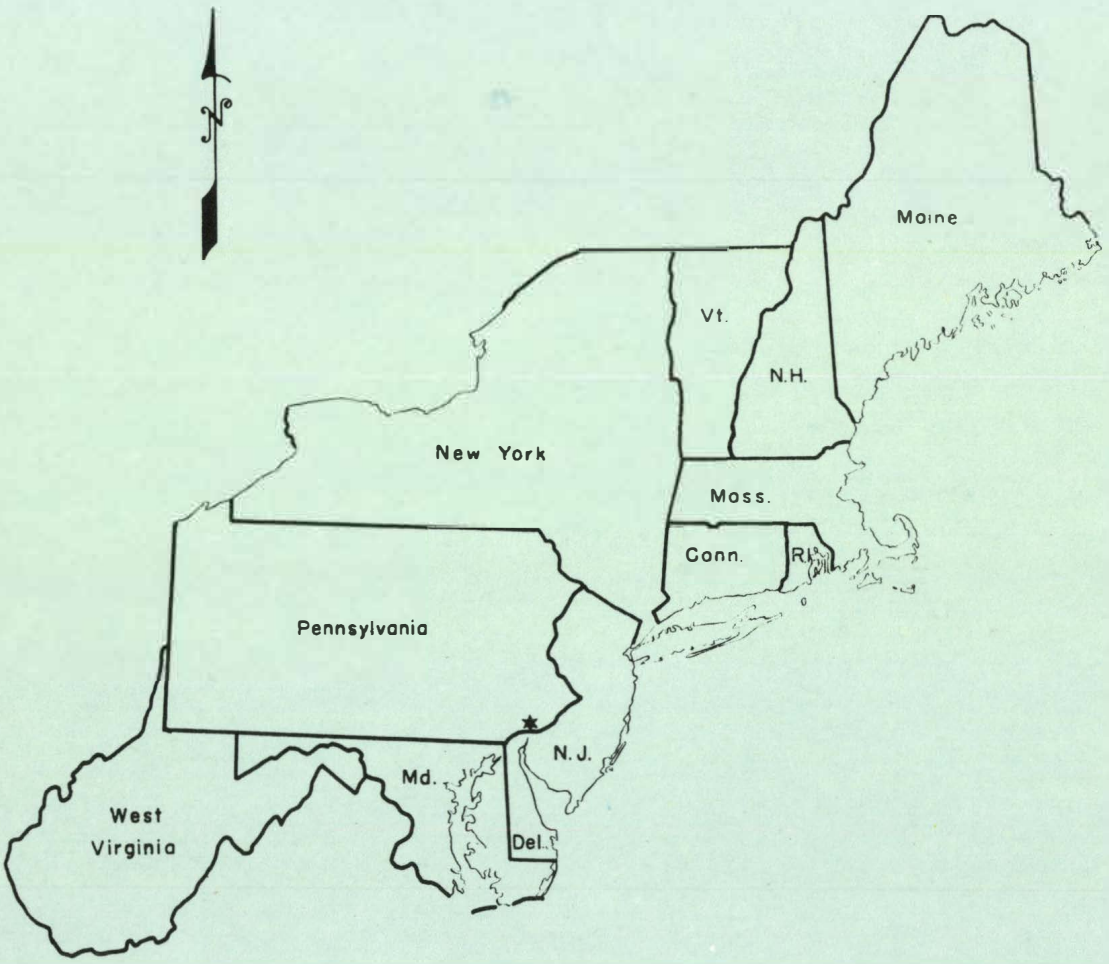
Hardwoods

Red oak (Northern red oak)	- Quercus borealis
(Black oak)	- Quercus velutina
(Scarlet oak)	- Quercus coccinea
(Pin oak)	- Quercus palustris
White oak	- Quercus alba
Chestnut oak	- Quercus montana
Hickory	- Carya species
Yellow-poplar	- Liriodendron tulipifera
Basswood (American basswood)	- Tilia americana
Sugar maple	- Acer saccharophorum
Red maple	- Acer rubrum
Ash	- Fraxinus species
Elm	- Ulmus species
Other hardwoods	
(American beech)	- Fagus grandifolia
(Black cherry)	- Prunus serotina
(Cucumbertree)	- Magnolia acuminata
(Bigtooth aspen)	- Populus grandidentata
(Quaking aspen)	- Populus tremuloides
(Blackgum)	- Nyssa sylvatica
(Silver maple)	- Acer saccharinum
(Butternut)	- Juglans cinerea
(Sycamore)	- Platanus occidentalis
(Black locust)	- Robinia pseudoacacia

Softwoods

Hard pine (Pitch pine)	- Pinus rigida
(Virginia pine)	- Pinus virginiana
(Shortleaf pine)	- Pinus echinata
White pine (Eastern white pine)	- Pinus strobus
Other softwoods	
(Eastern hemlock)	- Tsuga canadensis
(Eastern redcedar)	- Juniperus virginiana
(Table mountain pine)	- Pinus pungens

[1] U.S. FOREST SERVICE. CHECK LIST OF THE NATIVE AND NATURALIZED TREES OF THE UNITED STATES INCLUDING ALASKA. 325 PP. WASHINGTON. 1949.



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